



# **Hardy Fern Foundation Quarterly**



**Fall 2013**

# THE HARDY FERN FOUNDATION

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Web site: [www.hardyferns.org](http://www.hardyferns.org)

**The Hardy Fern Foundation** was founded in 1989 to establish a comprehensive collection of the world's hardy ferns for display, testing, evaluation, public education and introduction to the gardening and horticultural community. Many rare and unusual species, hybrids and varieties are being propagated from spores and tested in selected environments for their different degrees of hardiness and ornamental garden value.

The primary fern display and test garden is located at, and in conjunction with, The Rhododendron Species Botanical Garden at the Weyerhaeuser Corporate Headquarters, in Federal Way, Washington.

Affiliate fern gardens are at the Bainbridge Island Library, Bainbridge Island, Washington; Bellevue Botanical Garden, Bellevue, Washington; Birmingham Botanical Gardens, Birmingham, Alabama; Coastal Maine Botanical Garden, Boothbay, Maine; Dallas Arboretum, Dallas, Texas; Denver Botanic Gardens, Denver, Colorado; Georgia Perimeter College Garden, Decatur, Georgia; Inniswood Metro Gardens, Columbus, Ohio; Lakewold, Tacoma, Washington; Lotusland, Santa Barbara, California; Rotary Gardens, Janesville, Wisconsin; Strybing Arboretum, San Francisco, California; University of California Berkeley Botanical Garden, Berkeley, California; and Whitehall Historic Home and Garden, Louisville, Kentucky.

Hardy Fern Foundation members participate in a spore exchange, receive a quarterly newsletter and have first access to ferns as they are ready for distribution.

*Cover design by Willanna Bradner*

**HARDY FERN FOUNDATION QUARTERLY**

THE HARDY FERN FOUNDATION  
**QUARTERLY**

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# President's Message

Here in the Pacific Northwest the last weekend of September has come in with sustained rain and wind that will make this the wettest September on record. Couple this with the driest July on record when no rain fell, and it calls for a tumultuous weather year. Unexpected August rains placated the dry midsummer and thus the landscape is green and lush. Climatologists are having a field day in trying to figure out and predict how the warming factors will be changing the world as we have known it. It is fascinating to look at past geological changes and their effect on plant evolution. Man's curious nature coupled with the use of recent technological developments has enable us to look into the past as never before to paint a developing world where life explodes and implodes in leaps and bounds in response to a changing world often under cosmic and geological outbursts. Man's recent presence and effect is truly unique; an organism that effects global changes that influence the planet's climate and composition, and thus the future evolution of all the inhabitants of the planet.

Our last board meeting was at the Bellevue Botanical Garden. The Garden is under major renovation that includes new facilities, expanded parking and a new focus on the visitor and how they can connect to the landscapes and plants of the growing and popular Botanical Garden. It is truly amazing to see the expansion of the gardens in the last few years, and for HFF to have played a part in introducing ferns to the gardens through the years.

I would like to give special thanks to Sue Olsen, Michelle Bundy and Jo Laskowski for all the wonderful work they put in on producing the Hardy Fern Foundation Quarterly. The quarterly is HFF's connection to our members. Through the Quarterly, HFF events, projects and endeavors are chronicled. Wonderful articles by members and fern and plant experts share their exploits, travels and knowledge. I believe the Quarterlies are getting better with more interesting articles often accompanied by photos. I have enjoyed articles of fern forays written by members from throughout the country. I always enjoy James Horrocks' specific fern descriptions with always a bit more information that I don't find elsewhere. Joan Gottlieb's articles have a depth of information on plant/fern development and evolution that I find most interesting and fascinating. Description of member's travels to natural areas and landscapes, botanical gardens and ferneries from all around the world takes us on 'travels' we can only experience literally.

Keeping in touch with our website is a great way to keep in touch with what is happening at HFF. Check on the events calendar to keep abreast of fern happenings. There is good information on fern culture and recommendations. If you have great fern photos we would certainly like to expand the Fern Photo Library.

The cool days and evenings of fall are upon us. My *Woodwardia unigemmata* and *areolata* are still unfurling out a colorful frond or two in their pots out on the patio. *Athyrium filix-femina* growing in wet ditches and other moisture retentive soils is looking tattered and yellowed on its way to a deep winter's sleep. It is time to sit in front of the wood fired

stove on these wet cool evenings and plan for some fall fern plantings.

Happy fern gardening, John van den Meerendonk.

## ***Polystichum lonchitis***

### **Northern holly fern Narrow holly fern**

James R. Horrocks ~ Salt Lake City, UT

The species epithet “lonchitis” is translated “narrow-leafed”, an apt description, making this species easily recognized, although it could possibly be confused with *P. imbricans* in the Pacific Northwest. *P. lonchitis* is the quintessential montane-circumboreal species, found on every continent in the northern hemisphere. Its distribution is an interesting study in and of itself. It grows near sea-level in southeastern Alaska, but is essentially confined elsewhere to sub-alpine forests in western Canada down through the western United States to northern California in the Sierra Nevada mountains, across Oregon to Idaho and Montana, down through northern Utah to western Colorado where it ranges a bit further south in the Rocky Mountains with a somewhat disjunct population in southern Arizona. To the east it is found in Greenland, Newfoundland, and Nova Scotia down to Quebec and Ontario, but only in Michigan and Wisconsin in the Great Lakes region of the eastern United States. In Europe and Asia it is native from the British Isles across Europe to northern China, Mongolia, Siberia, the Kuriles and south to Japan. This species is also found in the western Himalaya, the Caucasus, and Iran and even south to northwest Africa, which is about as far south as its range in North America.



*Polystichum lonchitis*

*Polystichum lonchitis* inhabits north-facing talus slopes, rocky crevices and ledges, mostly of limestone. It is interesting to observe that as one walks up the trail above Alta in Little Cottonwood Canyon in the Wasatch Mountains of Utah, *P. lonchitis* frequents the limestone habitats in circumneutral soils, but on the other side of the trail, it is infrequent to rare or nonexistent in the metamorphic (quartzite) and igneous (quartz-monzonite) material, being replaced by *P. scopulinum* which finds the subacid soils to its liking.

*Polystichum lonchitis* is believed to be one of the parent stocks along with *P. lemmonii* of *P. kruckebergii* of western North America. *P. lonchitis* hybridizes with *P. braunii* to form *P. x meyeri* and with *P. acrostichoides* to form the sterile *P. x hagenahii*. It also crosses with *P. aculeatum* in Great Britain to form *P. x illyricum*, and on a more astonishing note, *P. lonchitis* has crossed with *Dryopteris goldiana* to produce a natural cross-genera hybrid

called *Dryostichum x singulare*!

Description: The rhizome is short and thick, the numerous fronds arising from a central crown. The fronds are once-pinnate, evergreen and a “brilliant kelly green” as Sue Olsen puts it. The stiff leathery fronds are 1 to 2 1/2 inches wide and usually from 4 to 24 inches long. The author, however, encountered specimens in a sizeable colony along the trail on the north side of Mount Timpanogas (Wasatch Range of Utah) with fronds measuring 36 inches in length! The black stipe is very short, seemingly nonexistent in some specimens, exhibiting pale-brown or reddish brown concolorous scales. It has reduced triangular pinnae at the base that appear as mere wings and extend nearly to the rhizome. The upper pinnae are close-set and spiny-serrate, the small spines often so crowded they overlap. The upper scythe-shaped pinnae are sub-falcate with a superior auricle, and turn upward. All total, the pinnae number 20 to 30 or more pairs. The fronds are linear-lanceolate to oblanceolate in outline, ending in an acute or sometimes acuminate apex. The sori are crowded and covered with peltate indusia. They are borne chiefly on the upper half of the frond. Scanning electron micrographs of the spores of this species reveal that, quoting David Wagner: “*Polystichum lonchitis* is the only species of North American polystichum with a spiny perine.” (the outer projections on the spores).

Culture: It goes without saying that this fern is very cold hardy. What is of interest is how varied the opinions are of how this fern responds to cultivation. Everything from easy to grow in potting mix to very difficult, if not impossible in any growing medium have been mentioned. It should never be removed from the wild as it does not re-establish well. It will not survive in hot valley gardens! This species requires mild temperatures and a cool, crumbly, constantly damp but well-draining soil to survive. It can be grown from spore and perhaps with some experimentation and a great deal of extraordinary luck, there just might be a niche for it in some garden rockery. The author, after many failed attempts, simply admires it in the cooler canyons several miles east of his hot valley garden.

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# Great Plant Picks

Rick Peterson ~ Chairman

Miller Botanical Garden, Seattle, WA



Where do you turn when you are looking for a new car or refrigerator? Perhaps you ask a friend who has some expertise with these products or you might purchase *Consumer Reports* magazine for some reliable information. Many manufactured goods and products are reviewed by that trusted organization. However, where do you turn if you need reliable information about plants for your garden? Great Plant Picks (GPP), the primary educational program of the Elisabeth Miller Botanical Garden in Seattle, Washington, is developing a comprehensive palette of exceptional plants, primarily for the maritime areas of southwestern British Columbia, Canada and the western portions of Oregon and Washington State, USA.

GPP began in 2001 with a committee of regional professional horticulturists from botanic gardens, arboreta, wholesale and retail nurseries, and designers to select plants that are best suited for gardens located between Eugene, Oregon and Vancouver, British Columbia, west of the Cascade Mountains. This region is not wholly homogenous. Portland, Oregon tends to be somewhat hotter in the summer than Seattle, Washington and Vancouver, BC is somewhat wetter than Portland. However, using a set of strict selection criteria each GPP plant must thrive in all areas of the region.

The selection criteria require that GPP selections are hardy in USDA zones 7 and 8 (although many are hardy in colder regions), long-lived, vigorous, and easy to grow by a gardener of average means and experience. Plants requiring specialist knowledge are not considered. They must be reasonably disease and pest resistant, have a long season of interest – preferably multiple seasons of interest, and be available from at least two retail plant sources. In addition, the chosen plants are adaptable to a variety of soil and fertility conditions and they are not invasive or overly vigorous in colonizing the garden or larger environment.

Nomenclature, i.e., the naming of any particular plant, is very important for the GPP program and the staff researches each botanical name thoroughly to be as accurate as possible. The first source referred to is *The Plant Finder*, a book published by the Royal Horticulture Society based in London (information in the book may also be accessed online at <http://apps.rhs.org.uk/rhsplantfinder>.) When not listed in the aforementioned book the staff looks to another source which is [www.theplantlist.org](http://www.theplantlist.org). This information is presented from the collaborative efforts of the Royal Botanic Gardens, Kew, United Kingdom and the Missouri Botanical Garden, St. Louis, Missouri and others such as The New York Botanical Garden, Bronx, New York. The latter list does not account for cultivated varieties of plants so other horticultural references are then used. Common names, although notoriously inconsistent across continents or even locally, are included for those who are more familiar with these monikers.

The first list of Great Plant Picks debuted with 15 plants and has grown to over 900 in the last twelve years with the full range of trees, shrubs, conifers, bulbs, perennials, bamboos, groundcovers, and ferns. Indeed, there are currently 33 fantastic ferns on the GPP list. These ferns were recommended to the GPP Committee by an advisory group of fern specialists. When there are large groups of plants such as ferns, rhododendrons, or roses GPP staff invite horticultural professionals and aficionados to become part of an advisory group which meets and proposes plants with outstanding qualities to the GPP Committee, which has the final determination.

Once a plant has been awarded the GPP “seal of approval” detailed information is gathered such as characteristics of growth, culture, and, of course, what makes it a top choice. This data, along with an image, is placed on a “fact sheet” for each selected plant with the entire list of Great Plant Picks featured at [www.greatplantpicks.org](http://www.greatplantpicks.org) along with a directory of nurseries that carry these exceptional plants. In addition, one can do an advanced search on the GPP website to select plants for foliage type, growth habit, light requirements, moisture needs, or soil types. This is particularly helpful if one has specific growing conditions.

The current GPP ferns are listed below. For images and more detailed information go to the GPP website.

DT = drought tolerant

*Adiantum aleuticum* - western maidenhair fern. Graceful, bright green fronds for the woodland garden! **deciduous**; 30”x30” (.75x.75m); light to dappled shade, constant moisture in sun; USDA 3-9; NW **native**



*Adiantum aleuticum* - Western maidenhair

Photo courtesy of Great Plant Picks

*Adiantum venustum* - Himalayan maidenhair fern

Delicate spring green fronds form a gentle groundcover; **evergreen**; 8”x3’ (.2x.9m); light to dappled shade (can be DT in latter); USDA 5-8

*Asplenium* (syn. *Phyllitis*) *scolopendrium* - hart’s-tongue fern

Distinctive wide, strap-like bright green leaves; **evergreen**; 18”x18” (.53x.53m); open to deep shade; moist, well-drained soil; USDA 6-8

*Asplenium trichomanes* - maidenhair spleenwort

Diminutive fronds form charming short tufts of green foliage; **evergreen**; 8”x10” (.2x.25m); light to deep shade (can be DT in latter); USDA 5-8; NW **native**



***Athyrium filix-femina* ‘Frizelliae’** - tatting fern (See photo page 101)

Strikingly unique fronds are very narrow with fan-like leaflets; **deciduous**; 18”x18” (.5x.5m); light to dappled shade; moist, well-drained soil; USDA 5-8

***Athyrium* ‘Ghost’** - ghost fern

Delicate, lacey fronds glow a pale mint-white, creating a ghostly appearance; **deciduous**; 3’x2’ (.9x.6m); light to open shade; moist, well-drained soil; USDA 5-8

***Athyrium niponicum* var. *pictum*** - Japanese painted fern

This fern brings sensational shades of purple, red, and silver to the garden, brightening up any dark corner; **deciduous**; 18”x18” (.5x.5m); open to dappled shade; moist, well-drained soil; USDA 5-9

***Athyrium otophorum*** - eared lady fern

Elegant and eye-catching fronds of whitish-green fronds Each new frond unfurls with a purplish cast that quickly gives way to long-lasting pale green. The central leaf stem retains the purple hue; **deciduous**; 18x24 (.5x.6); open to dappled shade; moist, well-drained soil; USDA 5-8

***Blechnum penna-marina*** - alpine water fern (See photo page 101)

Miniature deer fern-like fronds emerge copper-red in the spring, gradually fading to a rich green - slowly creeps to fill cracks and crevices between paving stones or rockery walls. It can also be used as a small-scale groundcover; **evergreen**; 8”x5’ (.2x1.5m); light to dappled shade; moist, but DT in shade; USDA 7-10

***Blechnum spicant*** - deer fern

Spring fronds unfold into tiny upright ladders of foliage that expand into a lax mound of glossy, dark green leaves; **evergreen**; 24”x24” (.6x.6m); light to deep shade; moist USDA 5-9; NW native

***Cyrtomium caryotideum*** - holly fern

***Cyrtomium falcatum*** - Japanese holly fern

***Cyrtomium falcatum* ‘Rochfordianum’** - Rochford’s holly fern

***Cyrtomium fortunei*** - Fortune’s holly fern

***Cyrtomium macrophyllum*** - large leaf holly fern (See photo page 101)

Bold fronds of light to matte green shine in the woodland garden where holly ferns provide prominent textural diversity; **evergreen**; 18”x24” (.5x.6); light to deep shade; moist, well-drained soil; USDA 7-10

***Dryopteris crassirhizoma*** - thick-stemmed wood fern

A show piece fern that forms a massive scaly light-brown “trunk” over time. New fronds emerge covered in golden-brown hairy scales, reminiscent of furry arms stretching out from a long winter’s nap; **deciduous**; 3’x2’ (.9x.6m); light to deep shade; moist, well-drained soil; USDA 6-9

***Dryopteris cycadina*** - shaggy shield fern

Reminiscent of cycads, tropical plants of ancient origin, the bright green fronds with black stems forming a vase-like fountain; **deciduous**; 3’x3’ (.9x.9m); light to deep shade; moist, well-drained soil; USDA 5-8

***Dryopteris erythrosora* - autumn fern**

Dramatic new foliage with autumnal colors of bronzy red and orange appear in springtime; **deciduous**; 2'x2' (.6x.6m); light to deep shade; moist, but DT in shade; USDA 6-9

***Dryopteris lepidopoda* - sunset fern**

In late spring, new coppery-pink fronds open quickly developing to orangey-bronze tones that then mature to a glossy, deep olive green; **deciduous**; 18"x2' (.5x.6m); light to deep shade; moist, well-drained soil; USDA 6-9

***Dryopteris wallichiana* - Wallich's wood fern**

A tall – up to 4 or even 5 feet (1.2 to 1.5m) – and stately fern forming a graceful, wide vase of deep green fronds; **deciduous**; 5'x3' (1.5x.9m); light to deep shade; moist, well-drained soils; USDA 6-9

***Gymnocarpium disjunctum* (often sold as *G. dryopteris*) - common oak fern**

This charming deciduous woodland native makes a tough yet delicate groundcover. The new fronds emerge in spring a fresh apple-green holding this bright color until they collapse in late summer to early fall; **deciduous**; 10"x6' (.2x1.8m); light to deep shade; moist; USDA 2-8; **NW native**

***Osmunda regalis* - royal fern, regal fern**

***Osmunda regalis* 'Cristata' - crested royal fern**

***Osmunda regalis* 'Purpurascens' - purple-tinged royal fern**

***Osmunda regalis* 'Undulatifolia' - undulate royal fern**

Large, bold, bright green fronds on this handsome, majestic garden fern grow up to 6 feet (1.8m) tall into an upright vase shape; **deciduous**; 6'x5' (1.8x1.6m); light to open shade, moist to boggy soil; USDA 4-9

Each leaflet on 'Cristata' has a crest of lobes on its tip.

'Purpurascens' has been selected because the main stem of its fronds is tinged deep purple.

Each leaflet on 'Undulatifolia' has a wavy edge giving the plant a frilly appearance.

***Polystichum makinoi* - Makinoi's holly fern**

Lustrous, olive-green fronds bring a refined, sophisticated look to the garden; **evergreen**; 2'x2' (.6x.6m); light to deep shade; moist, well-drained soil; USDA 5-9

***Polystichum munitum* - sword fern**

An arching mound of dark green fronds make this fern effective as a specimen and equally beautiful en masse; **evergreen**; 4'x4 (1.2x1.2m); full sun, with moisture, to full shade where it is DT; USDA 3-8; **NW Native**

***Polystichum neolobatum* - Asian saber fern (See photo page 101)**

A vase-shaped fern with glossy green and leathery fronds held stiffly upright, even though our occasional snows; **evergreen**; 24"x30" (.6x.75m); light to deep shade; best is moist, but well-drained soil; USDA 6-9

***Polystichum polyblepharum* - Japanese tassel fern**

The fronds of this fern are lustrous and add a sparkle to a woodland planting; **evergreen**; 2'x2' (.6x.6m); light to deep shade; moist, but well-drained and humus-rich soil; USDA 6-9

***Polystichum setiferum* Divisilobum Group** - soft shield fern, hedge fern

The finely dissected fronds arch gracefully, creating mounded plants with architectural interest. As the fronds arch, they also appear to swirl around the center of the plant; **evergreen**; 30"x30" (.75x.75m); partial sun, with plenty of moisture, to full shade; USDA 6-9

***Polystichum setiferum* Plumoso-multilobum Group** - plumose soft shield fern

The queen of all ferns this will grace any garden with an elegant, lacey appearance reminiscent of Victorian times. A cool feature of this fern is that the fronds curve outwards from the center of the plant -- from above this resembles a whirlwind!; **evergreen**; 18"x2' (.5x.6m); light to deep shade; moist, well-drained soil; USDA 6-9

***Polystichum tsus-simense*** - Korean rock fern

Each frond of this fern is delicately laced with black veins that accentuate its rich, dark green leaves. Definitely a smaller and charming fern with a neat appearance; **evergreen**; 1'x1' (.3x.3m); light to deep shade; moist, well-drained soil; USDA 6-9

***Woodsia polystichoides*** - holly fern woodsia

This charming and diminutive fern is like a miniature sword fern; **deciduous**; 10"x12" (.2x.3m); almost full sun to light shade; moist, well-drained soil; USDA 6-9

## Waiting for Sporelings

Guenther K. Machol ~ Saratoga, CA

"It's easy to grow ferns from spores," the article began, and I couldn't wait to try. I filled a transparent carry-out container with well-moistened, sterilized peat moss, sowed *Doryopteris pilosa* spores, tagged the box with the start date, then set it aside in eager anticipation of a beautiful garden of green sporelings. After one month, nothing green in sight. Thinking that the container wasn't warm enough, I moved it to a bathroom windowsill where it would be warmed by diffused rays of the sun. Another month, but still no green garden. Maybe this wasn't a good location either – the spores might be getting baked – so I moved the container into a fluorescent-lit box. After just one more month, there was the green garden – almost; it was a carpet of dark-green algae, covering the entire peat surface! I guess it's high time for me to read the rest of the article...

Now, for two units of credit in the Continuing Studies program, answer True or False:

- a) Sun-baked spores have no will to germinate.
- b) Patience is not required for growing ferns from spores.
- c) Algae and gametophytes are friends.
- d) Growing ferns from spores is easy.

(editor's note....I'm happy to report that the author has since been successful with his spore raising efforts.)

# Fun in the Sun: the story of a Northwest garden tour.

Jo Laskowski

Seattle, WA

Sunday, June 30 2013. A day forecast to be in the mid- to upper 80's. That's an outrageously early "hot spell" for a Pacific Northwest summer and the sort of temperatures that send a good NW native shrieking for shade. So of course it was the day of Hardy Fern Foundation's annual garden tour.

Kindly—while not even yet a board member, Linda Pyles had generously spent a lot of time putting the tour together. We would meet north of Seattle to form carpools to visit three gardens, then return to the rendezvous for lunch and the chance to see its garden.

By 8:30AM everybody had rolled in to the meeting place. After the typical chaos and comedy of figuring out carpools, we were on our way to coffee and coffee cake at the first stop. I think the best garden tours are accompanied by food, and it was the case that three of the four gardens would have food on offer—smart woman, that Linda.

Bob Fairfax lives in an exquisite log structure on five acres. Although logged shortly before his purchase in the late 1970's, the little saplings of then have become the impressive Doug firs of today. Both Doug fir branches and foliage are designed to move easily in wind or slight breeze—the bright shade made by their canopy was charged with buttery daubs dappling through the understory.

This is an atypical garden, lacking as it does the conventionally usual or unusual ornamental shrubs, trees and perennials. But it's perfect for moss, sword ferns and nurse logs with young tree roots clambering over them. The carpet of moss was like nothing I've ever seen in a private garden—weed-free and covering literally every speck of ground except the serpentine trails and patiently conquering most of the exposed erratics. Did I say WEED-FREE? There are 44 kinds of moss. Their complex little spore structures had popped up in places minutely interrupting the flow of the moss. The garden also belongs to the resin forms that Bob creates and plants. Fenulents and



Fairfax Garden  
Photo courtesy of Jo Laskowski

smilies and slumpies populate clearings, lifting seamlessly from the landscape. Who's what and what's who gets a little murky here. The Badarki Wall and Rune Wall and Web Wall rise and curve along the trail. I felt like I was on a scavenger hunt when I found the elusive Beetle Owl in the hollow of a burned-out stump. This most serene of all landscapes is a wonderful place.

We headed out for our next snack garden. I mean garden. Chris and Don Hoerner have a half-acre and have had 15 years' time to stuff their beds with an exuberance of plants and continue with additions and revisions so common to plant lovers. Two rain gardens were recently new, an effective and attractive solution for rainwater runoff on their sloping back yard.

I love sweeping, curvy bedlines and big beds and the Hoerners' didn't disappoint. Immaculately maintained lawns served as broad pathways throughout and were a stellar contrast to the visual busyness of the plantings. Japanese maples rose above their companion plantings and uncommon evergreens showed themselves to the observant eye. I noticed the blueberry bed, neatly and tongue-in-cheekily defined by a vintage white wrought-iron headboard and footboard. We pried tour members away from the shade and the brownies, and retreated to our air-conditioned cars. Good thing the gardens were far apart—it gave those of us who were not so discreetly melting in the heat a chance to solidify our composure.



Hoerner Garden  
Photo courtesy of Jo Laskowski

The small city lot-sized property of Ed Poquette and Fred Rowe reflected their thoughtful refurbishment over the past eight years. (See photo page 100) The public space of their front yard had just been replanted to a European concept of the meadow garden. Even under the palpable weight of the heat it was responding to slight air currents, indolently waving the grasses and flowers that soared to waist height. Ed and Fred too are conscious of water management and hope this new installation will be economical with the particulars of their slope and soil type.

When we moved through the side yard we were startled by our reflections. Mirrors cleverly turned a narrow corridor into seemingly immense beds. What a bang-up idea! I was more than a little impressed with how clean the mirrors were too, as I reflected on what it must take to do that—nearly immeasurable dedication.

In the back, an immense Harry Lauder's Walking Stick—*Corylus avellana* 'Contorta'—





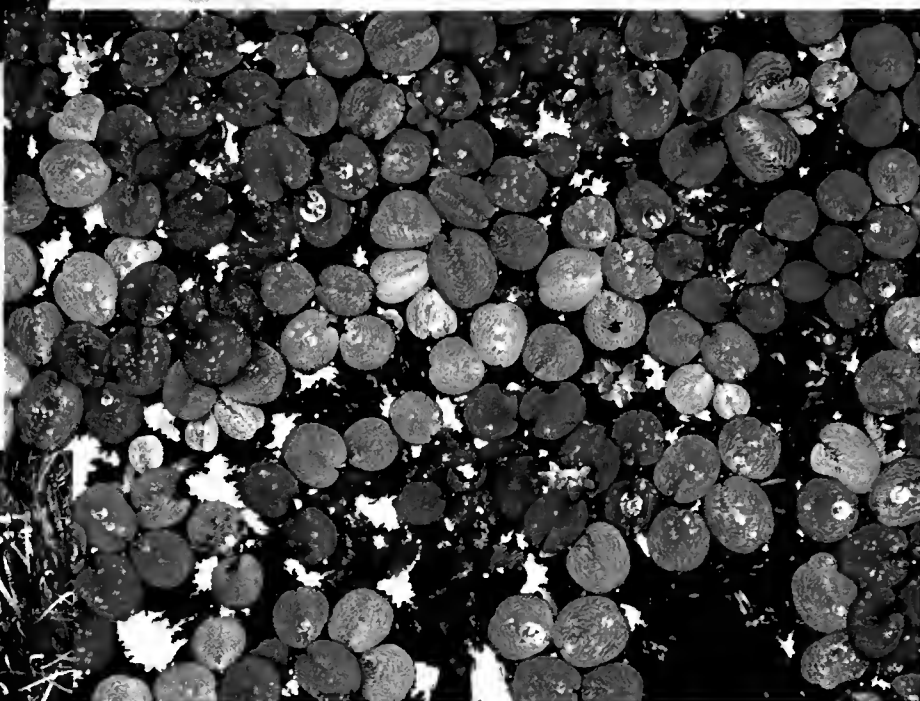
***Pleopeltis  
polypodioides***

Resurrection fern growing on live oak branch at Blue Hole pond.

Photo left courtesy of Mary Stensvold

***Salvina minima*  
Water spangles**

Photo right courtesy of Mary Stensvold



**Ed Poquette and Fred Rowe  
Garden**

Photo left courtesy of Jo Laskowski

**Huntington Garden**

Photo right courtesy of Jo Laskowski







***Polystichum neolobatum***

**Asian saber fern**

Photo left courtesy of  
Sue Olsen

***Athyrium filix-femina***

**‘Frizelliae’ - Tatting fern**

Photo below courtesy of  
Sue Olsen



***Cyrtomium  
macrophyllum***

**Large leaved holly fern**

Photo left courtesy of Great  
Plant Picks

***Blechnum  
penna-marina***

**Alpine water fern**

Photo right courtesy of  
Sue Olsen



rose to ten plus feet, easily one of the largest and most well-kept private specimens I've seen. Speaking to their careful retention of plants already on site, it was airily pruned with excellent branch structure that showed off the rugose leaves and slinky catkins. I was so engrossed in an old apple espalier—another judicious holdover—I hadn't even realized what the *Corylus* was despite standing right next to it for a while. It was like when I looked up and figured out that the huge trunk I was lounging against in a dusty Mexican village was cousin to my ficus houseplant, a jolting realization, a warp-speed change in perception.

Electric orange-red *Crocosmia* bobbed against us as we gathered by the pond for water and conversation. Daylilies and ornamental grasses and arbors defined garden rooms and specimen evergreen trees punctuated the scene. I saw the speechlessly beautiful bark of *Prunus serrula*.

We headed back to our meeting spot. We'd be dining al fresco at Dan and Darlene Huntington's, on their two-acre property low on a hillside of the Snohomish River valley. Rich black soil, the residue of flooding and silt deposition, is characteristic of this area north of Seattle. Historically it's been used for agriculture and dairy and for the most part this continues to be true.

Much like in the Hoerner garden, the Huntington's have used lawns as pathways. The cottage style beds are curvilinear, chock-full of perennials and shrubs, and most are anchored by old Doug firs or well-established ornamental trees. A dearth of exposed soil pretty much guarantees you'll find few weeds.

One circular bed held lots of terra cotta pots and whiskey barrel halves of xerics—sedums, hens-and-chicks and cacti. (See photo page 100) All were of obvious age, some in flower, and some boisterously in thorn. Their sole companion was a limbed-up Doug fir and I liked this collision of plants from such customarily different environments. Snooping around the edges of the property brought me nearly face to face with a group of dairy cows. Some were taking the shade, while others placidly worked their cud to a view of Mount Baker in the distance. A car moved along a gravel road near me and miles of tanned legs appeared. Later I'd see their owner—a granddaughter—tossing an air mattress and other floatables into the pool, adroitly executing her own method of beating the heat.

Arbors are delightfully tucked away here and there. Several of us gathered in one near the house to have our lunch. A reference book was on the table—*The Encyclopedia of Garden Ferns*. I wondered about its presence, since ferns had certainly not been the focus of the particular gardens we had seen that day. Maybe because the tour was under the auspices of the Hardy Fern Foundation? Unbeknownst to our hosts, its author was part of our tour—the rider in my car in fact, coming from Seattle that morning. As realization dawned on author, hosts and tour members, it became one of those delicious moments when events dovetail too perfectly and satisfyingly for words. What a cool ending to a sizzling good tour!

# 2013 Fern Foray

## Ferns of the Atchafalaya Basin and Avery Island, Louisiana

Mary Stensvold

Sitka, AK

At 8:15 on Saturday, July 24, thirty-three fern enthusiasts, in search of ferns, piled onto a very comfortable bus and cruised out of the New Orleans Hilton bus tunnel. We travelled southwest, bound for the Atchafalaya River basin and Avery Island. Atchafalaya River basin is part of the huge Mississippi River delta system. Over the millennia the Mississippi's mouth has changed location many times, moving east and west across the delta. The Atchafalaya River is a secondary mouth of the Mississippi. At 137 miles long, the Atchafalaya is relatively short, forming at the confluence of the Red River and the Mississippi River. Because of concerns that the Atchafalaya would capture and cause a major reroute of the Mississippi River; the Army Corps of Engineers built river control structures just upstream of the confluence, continuing to allow 30% of the Mississippi River to drain into the Atchafalaya River. Southern Louisiana is made of soil from the middle part of North America that has washed down the Mississippi and deposited on the delta. This fertile flat land combined with large amounts of water and a subtropical climate results in an intricate complex of swamps and waterways.

Much of our route was on an elevated freeway crossing vast expanses of bald cypress (*Taxodium distichum*) swamps, very wild looking country. Meanwhile, fascinating fern conversation filled the bus. About 60 miles southwest of New Orleans we stopped at Wilson's Kountry Korner grocery/gas station in the tiny community of Chacahoula. Here we had a rest stop and chance to buy some junk food to tide us over until lunch. More importantly, we found our first fern, resurrection fern (*Pleopeltis polypodioides*). (See photo page 100.) This epiphytic fern was growing on large branches of an old southern live oak (*Quercus virginiana*). Most importantly, this is where we joined our guide for the day, Garrie Landry, a biology Professor at the University of Louisiana, Lafayette. He gave us a handout that included a checklist for ferns of south central Louisiana, and a publication: *Botanical Study of the Five Islands of Louisiana*, by W. D. Reese and J. W. Thieret (Castanea, Volume 31, No. 4, December 1966). Avery Island, our final destination is one of those five islands.

The bus dropped us off at our first formal fern stop about three miles north of Chacahoula. We were on a road cutting through a forbidding bald cypress-tupelo swamp (*Taxodium distichum*, *Nyssa aquatica*). We searched swamp pools



Fig. 1 The *Ceratopteris* grabber in action, preparing to grab a floating antler fern.

(Garrie Landry in black shirt).  
Photo by Chris Haufler.

for the extremely rare, floating antler fern (*Ceratopteris pteridoides*). Garrie had made a special “*Ceratopteris* grabber” out of a long pole and small rake-head, which he used to scoop the floating ferns from the water (Figure 1). This allowed us a closer look at these unusual ferns. The leaves of this fern are dimorphic, the sterile leaf has broad lobes, and the fertile blades are finely cut. Besides reproducing via spores, this fern also reproduces via buds that form in notches along the leaf margins. The plantlets arising from these buds are shown in Figure 2. Floating antler fern is growing at its northern range limit in Louisiana; it also grows in Florida, central and south America, southeastern Asia, India and China and is commonly sold as a “water sprite” aquarium plant because of its fast growth rate and ease of propagation. In swampy ditches along the road edge we saw several other ferns: marsh fern (*Thelypteris palustris*), common scouring rush (*Equisetum hyemale*), and Ferriss’ horsetail (*Equisetum x ferrissii*). Ferriss’ horsetail is a hybrid between tall scouring rush (*Equisetum hyemale* subsp. *affine*) and smooth scouring rush (*Equisetum laevigatum*). Because it is a hybrid between two species it does not produce viable spores, instead it reproduces vegetatively through its spreading rhizomes. Garrie pointed out the interesting fact that if the above-ground green stems are cut or mowed in to fragments, each green fragment is quite capable of producing a new plant. Floating stem fragments in water will quickly produce roots and small stems at the nodes, which will then become full size plants.



Fig. 2 Floating antler fern plantlets emerging from notches in the fern’s leaf margins. The fern was released to its ditch.

Photo courtesy of Chris Haufler.

Floating on the water’s surface was a mat of water spangles (*Salvinia minima*) (see photo page 100). Water spangles is an invasive plant in North America. This tiny fern invaded southern and eastern states from an initial introduction to Florida about 80 years ago (water spangles are native to Central and South America). This rapid spread is due to its tiny size and reproduction through fragmentation, these ferns and fragments are accidentally moved from water body to water body via boats, boat trailers, animals, and flooding. It is interesting to note that water spangles is not included in J. W. Thieret’s *Louisiana Ferns and Fern Allies*, published in 1980. Now, 33 years later, this invasive plant covers great expanses of Louisiana’s still waters. At this one stop we saw five species of ferns displaying four modes of reproduction: spores, budding, spreading rhizomes, and fragmentation.

Just as a thunderstorm started to dump torrents of rain, the bus arrived to pick us up. Our next stop was relatively close by, near the town of Gibson. The ecosystem at this stop was similar to the previous stop; again, water played a major role in the ecosystem (and atmosphere--we were dodging rain squalls associated



Fig. 4 Avery Island, a little more than two miles wide, is surrounded by swamps and prairies. Image courtesy of Google Earth.



with thunderstorms). Ferriss' horsetail was growing at the edge of a swamp pond. The surface of the water and associated ditches were covered with water spangles. Among the water spangles we saw another, much smaller floating fern, Carolina mosquitofern (*Azolla caroliniana*), a native plant, which is distributed across the eastern half of the United States. As we were hurrying back to the bus (outrunning the rain) we saw a royal fern (*Osmunda regalis*) at a distance of about 50 feet across a swamp. No one was brave (or foolhardy) enough to launch into the swamp and closely examine the plant.

We then drove about 35 miles west to an important stop: lunch at the Forest Restaurant in Franklin, where we enjoyed a variety of real Cajun foods. After lunch we continued west across the *very* flat Atchafalaya delta toward Avery Island. Avery Island is one of five salt dome "islands" that are aligned in a northwest-southeast trending line (they are Jefferson Island, Avery Island, Weeks Island, Cote Blanche Island, and Belle Isle). These salt domes are surrounded by land, yet are called islands because they arise out of the flat delta and support ecosystems much different than those of the surrounding delta.

The numerous salt domes in the southern United States are located on land and offshore on the adjacent continental shelf. They originated from layers of salt that were deposited as an ancient sea filled and evaporated many times. Subsequently, thick layers of sediment covered the salt. Because the salt is lighter than the sediment (now rock) the salt slowly rose through weak areas in the overlying rock; the upwelling salt rose as blobs and columns (think, Lava Lamp). Some of the salt masses are close enough to the surface to protrude from the surrounding delta as visible domes such as the five islands.

As we were driving toward Avery Island, Garrie called our attention to one of the salt domes, Weeks Island, about eight miles in the distance. Although it was noticeable in the flat landscape, we would not have seen it had he not pointed it out. Now we were driving through farmland dominated by sugarcane plantations. As we approached Avery Island via a side road, farmlands gave way to sawgrass prairies. Sawgrass is not a grass, but a sedge (*Cladium jamaicense*). Garrie had special permission to lead our group to parts of Avery Island that are off limit to the public, so we whisked through gates and past "no trespassing signs" to be deposited in the middle of the Island near the entrance of a salt mine. People have used Avery Island salt since prehistoric times; now the island supports a large salt mine. In addition to salt, Avery Island is the home to Tabasco Sauce, a hot pepper sauce. In the late 1860s an island resident, Edmund McIlhenny, mixed capsicum peppers from his garden with salt and vinegar -- Tabasco Sauce was born. Peppers are still grown on the Island and the sauce is still made here. Much of the island has been altered by human development, salt mines, pepper fields, a sauce factory, roads, canals, oil exploration, manicured areas and secluded residential areas. However, about half of the Island remains as mixed upland deciduous forest. Figure 4 shows Avery Island protruding above surrounding swamp and prairie, as well as the mosaic of land uses and forests on the Island.

After being dropped off we walked up a dirt road toward a pond called Blue Hole. The vine-like Japanese climbing fern (*Lygodium japonicum*) was weaving itself among the trees along the road to the pond. The leaves of this fern are extremely long, each "fern leaf" borne on the climbing tendril is a pinna, and the climbing tendril is the leaf's rachis. The pinnae

are dimorphic, sterile pinnae are not as finely cut as the fertile pinnae. Sterile and fertile pinnae are pictured in Figure 5. Japanese climbing fern is not native to the Americas; it was introduced to the American south in the early 20<sup>th</sup> century from eastern Asia. As we approached Blue Hole's shore we saw large live oak supporting an attractive population of resurrection fern (Figure 6) (see photo page 100.) When the weather is dry the leaves of these ferns dry out and curl up, when they have enough moisture they unroll, rehydrate and come back to life; thus the name "resurrection" fern. Near the Blue hole there is a shaded gully in the forest with an interesting array of ferns, but because water levels were high we could not clamber down to see them. From the edge of the gully we could peer down and see a Christmas fern (*Polystichum acrostichoides*). At the forest edge, along the forest/manicured meadow ecotone, we also saw ebony spleenwort (*Asplenium platyneuron*) and downy shield-fern (*Thelypteris dentata*).

Next we walked south on Pepper Field Road toward what Garrie called "a rookery". Walking on this narrow road through the forest was really pleasant; forest plants were interesting and the sun came out and birds were singing (Figure 7). Here we found southern shield-fern (*Thelypteris kunthii*) growing at the edge of the road on exposed soil (Figure 8). As we approached a pool called Saline Woods Pond, we could easily see large white birds perched in the trees on the Pond's far side (Figure 9). It turns out this is part of a large colony of snowy egrets; the colony was established by Edward Avery McIlhenny, in the 1890's. The hat-feather industry was eradicating snowy egrets, and he was concerned about their potential extinction. So he gathered the eight young egrets that initiated this nesting colony. Birds and their allies were impressive at Saline Woods Pond, which was almost entirely covered with water spangles, as shown in Figure 10.



Fig. 5 Japanese climbing fern, *Lygodium japonicum* fern showing sterile and fertile pinnae.

Photo courtesy of Mary Stensvold.



Fig. 7 Fern foray participants walking along Pepper Field Road through an upland deciduous forest.

Photo courtesy of Mary Stensvold.



Fig. 8 A luxurious clump of *Thelypteris kunthii* growing along Pepper Field Road between Blue Hole Road and saline Woods Pond.

Photo courtesy of Mary Stensvold.





Fig. 9 Snowy egrets (white dots) perched in trees on the far side of Saline Woods Pond; note water spangles covering the surface of the pond.  
Photo courtesy of Mary Stensvold.



Fig. 10 Close up of water spangles nearly covering Saline Woods Pond.  
Photo courtesy of Chris Haufler.

It was time to head back to New Orleans, so we returned to the salt mine and awaiting bus. On the way back we gave our sincere thanks to Garrie for a wonderful trip and dropped him off at Franklin, in the middle of Cajun country. The drive was long, but the time went quickly because the conversation was lively and the passing landscape was interesting. With a large dose of strange and interesting ferns, food, geologic features and animals, we had a fine fern foray.

**Ferns we saw in the Atchafalaya Basin and on Avery Island:**

<u>Scientific and common names</u>	<u>Atchafalaya Basin</u>	<u>Avery Island</u>
<i>Asplenium platyneuron</i> (ebony spleenwort)		X
<i>Azolla caroliniana</i> (Carolina mosquitofern)	X	
<i>Ceratopteris pteridoides</i> (floating antler fern)	X	
<i>Equisetum x ferrissii</i> (Ferriss' horsetail)	X	
<i>Equisetum hyemale</i> (common scouring rush)	X	
<i>Lygodium japonicum</i> (Japanese climbing fern)		X
<i>Osmunda regalis</i> (royal fern)	X	
<i>Pleopeltis polypodioides</i> (resurrection fern)	X	X
<i>Polystichum acrostichoides</i> (Christmas fern)		X
<i>Salvinia minima</i> (water spangles)	X	X
<i>Thelypteris kunthii</i> , (southern shield-fern)		X
<i>Thelypteris dentata</i> (downy shield-fern)		X
<i>Thelypteris palustris</i> (marsh fern)	X	

# Frond base propagation

Julian Reed

Kent, England

This article was prompted by the disappointment of many present at the BPS cultivar group meeting held on 1<sup>st</sup> September last year when we ran out of time to demonstrate frond base propagation using *Asplenium scolopendrium*.



So, why propagate from frond bases? Various answers spring to mind, the most obvious being:

- 1) To propagate sterile varieties. (Assuming they are garden worthy enough to propagate!)
- 2) To save the life of plants that have had their crown destroyed or damaged.
- 3) To propagate from a plant that has no ripe spores without uprooting the plant.
- 4) It is quicker and easier than growing from spores and the resulting plants are identical to the parent.

## Some history.

Charles Druery gave a description of frond base propagation in his book 'British Ferns and their Varieties' (1910). In summation he states that in order to restore the health of an old fern it is best to dig it up, wash thoroughly and cut away the old caudex (the stem-like bit below the crown). This leaves the crown and the green piece below the crown. This needs to be re-potted in as small a pot as possible.

You will be left with the small sausage-like frond bases. Trim away any roots as well as any dead material and wash them well. He goes on to say that a couple of inches (5cm) of well washed silver sand is put in a glass jar. The frond bases are scattered over this and covered with a glass slip. Then stand it in a well-lit position in a room or conservatory. If in the growing season or if warmth be afforded white pimples will appear within a few weeks and in time each pimple will become a plant. He also reported that he found 36 plants on a 1 inch piece of frond base (In my experience I have never seen so many on a frond base.)



Fig. 1 A prepared frond base about 1 inch (2.5 cm) long. The old roots have been removed and the frond base sterilised.

Reginald Kaye also wrote about this type of propagation in his book 'Hardy Ferns'

(1968) and I followed his system when I did this for the first time, a long time ago. His method is very similar to Drury. He says that you need to be very clean with all that you do and cover any container with glass or polythene. His estimate is an easily achievable 1-12 plantlets per frond base. He then says to transfer them to sandy compost when big enough to handle and keep covered with glass or polythene until well established. He also points out that the new plants will be identical to the original.

Figs. 1 to 3 show three stages in the process. I must admit that I thought I had lost this frond base as it went white with fungus. Fortunately, I did not get around to getting rid of it and was delighted to see the young fronds appear. However, treatment with a weak solution (rosy pink in colour) of potassium permanganate would have helped.

Fig. 1. A prepared frond base about 1 inch (2.5 cm) long. The old roots have been removed and the frond base sterilised.

Fig. 2. The frond base placed on sterilised silver sand that had been pre-washed. Note the plastic bag ready to seal the pot.

Fig. 3. Small ferns ready to be split off and transferred.

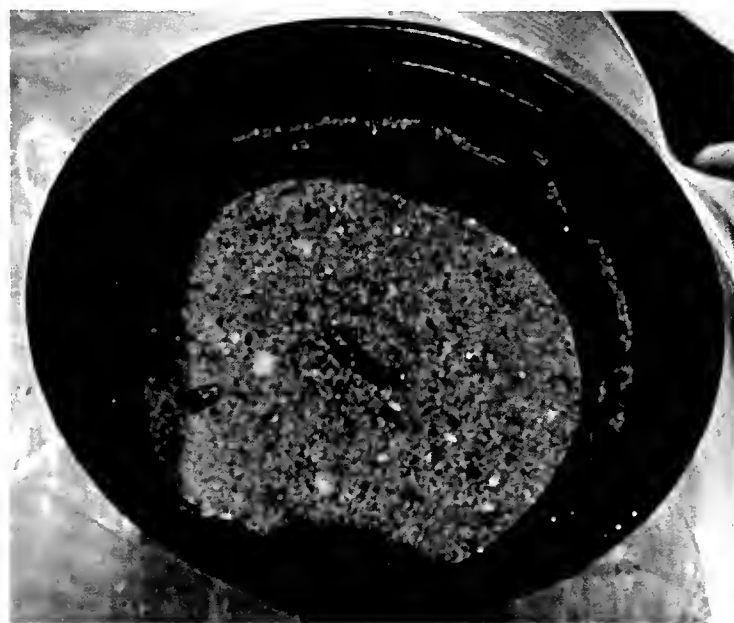


Fig. 2. The frond base placed on sterilised silver sand that had been pre-washed. Note the plastic bag ready to seal the pot.

### **Method:**

You will need:

Kitchen paper towel

Washed sand (horticultural grade sand or horticultural silver sand)

Clean thickish plastic pots (thin ones distort or melt) or seed trays if working with a lot of frond bases

Fresh sealable sandwich bags for pots or clean sheets of glass for seed trays

Sharp knife

Cold pre-boiled water

Sterilised tweezers or plastic gloves

I also use a dilute sodium hypochlorite solution based on a retail product used for sterilising baby bottles. I dilute according to the manufacturer's recommendations.

Lots of growers do not sterilise frond bases but just wash them thoroughly

### **Pots and sand**

1) Sterilise pots or seed trays with boiling water

2) Place a piece of paper towel in the base of the pot or seed tray to stop the sand from washing out

3) Half fill container with pre-washed sand

4) Place kitchen paper towel over leveled sand

5) Pour boiling water so it over flows the container

- 6) Repeat 5) at least 2-3 times. Leave paper in place.
- 7) Allow to cool in sealed sandwich bag or cover with glass

### **Collecting frond bases**

Collect by lifting the plant, shake any loose soil off the roots and then wash the remaining soil from the roots. I use a hosepipe, but you could use a bucket of water. Most ferns will produce a lot of frond bases and therefore a lot of plants. You need to ensure that you have plenty of sterilised pots of sand ready to cope with all of this propagation. Remember to re-pot the fern after you have removed all the frond bases.

However, if you do not want to lift the plant, run your finger down the side of the plant and feel for a frond base. Then push it down and out. It should click off and then you can remove it. This may not get the whole frond base but as long as you have most of it and it is green in the centre it will be fine. Look for older frond bases at least 2-3 years old as these seem to work better than ones from this year's fronds as they are usually too soft.

### **Preparing frond bases**

- 1) With a sharp knife trim off any bits of root and any torn off pieces of caudex (rootstock) and the dead pieces of brown dead stipe (frond stem)
- 2) Wash thoroughly or soak in Sodium Hypochlorite solution 0.6% for 15 mins
- 3) Rinse in cold pre-boiled water

### **Dealing with prepared frond bases.**

Take the paper off the top of the pot as this has kept it clean while cooling, then press the frond base horizontally into the sand (others prefer to insert them in the sand with the root end pointing up). Then reclose the bag squeezing most of the air out. Place in a propagator or warm window ledge in a well-lit position out of direct sunlight. I use a window ledge with a radiator under it as I seem to do most of my propagation in autumn but in summer a warm window ledge or greenhouse will be fine.



Fig. 3. Small ferns ready to be split off and transferred.

As mentioned above within several weeks to a month they will start to produce tiny white pimples easily confused with sand grains. Only open the bag if you need to treat for molds. Soon they will produce small fronds but wait until they obviously have roots. Then they can be removed like a seedling and taken off the frond base by sliding the point of a needle to pop them off. Leave any that are too small or not rooted and place frond base back in the same orientation. You can get several batches of plants before the frond base has run out of steam.

The young plants then need to be potted into compost with some extra sand in it and either put into a plastic bag or under a plastic propagator cover. Keep closed and humid till growing well then introduce a small amount of air. After 3 days slowly give more air and over a period add more so they get used to your growing environment, without flagging. They can then be grown on till they are ready to go into their own individual pots. This is best done between March and early September so they are well rooted out to survive the winter. Overwinter in a cold frame or greenhouse or keep growing on in a heated greenhouse or spare room if your beloved allows!

Looking through the back copies of the *Pteridologist* I found that Martin Rickard wrote an article in 1986 called 'Vegetative reproduction in Ferns' where he talks about artificially induced bulbils on leaf bases of *Asplenium scolopendrium* and mentions how a mystique around this easy process has developed and that it works well on *Oreopteris limbosperma* and *Athyrium filix femina*. He talks of *Polystichum setiferum* being more difficult. I did try *Polystichum* a few years ago but had no success. I will have to try *Athyrium*. Do have a go! It is easier than growing from spores.

Good luck!



Fig. 4. 6 month old *Asplenium scolopendrium* 'Kaye's Superb' grown using this method.

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Druery. C. T. (1910). *British Ferns and their Varieties*, George Routledge and Sons, Ltd

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## ***Osmunda* continued – an interesting and welcome response from Dr. Dick Lighty, Director Emeritus, Mt. Cuba Center**

You may remember my *Osmunda* hybridization project at Springwood where I tried to germinate paired spores of *Osmunda* species *in vitro*; all combinations of *Osmunda regalis*, *O. japonicum*, *Osmundastrum cinnamomeum* and *O. cinnamomeum* subsp. *fokiensis*. It was a failure, but I had noticed that, in the swale down the center of our lawn (where I had a number of *Osmunda* and *Osmundastrum* plants growing), *Osmunda* gametophytes were growing on any spot with bare, constantly-moist clay and no more than a light sprinkling of moss growing. Some of these produced sporophytes, all of which were typical native *O. regalis*.

Taking my cue from nature, I then collected spores in quantity from the four taxa mentioned above, and sprinkled this over all the bare clay areas. I was rewarded with sporophytes in quantities, most of which were *O. regalis*, a very few were *O. japonica*, and a small number were atypical of either. The latter I selected out and transplanted as possible hybrids of unknown parentage.

We left Springwood shortly after, but I took eight or so of the possible hybrids with me. When they produced sporangia, six of these turned out to be sterile. It was at that time I wrote you to see if you knew of anyone who might be interested in validating the parentage of these, as there were differences among them. Unfortunately, none of the leads I had from you and other sources replied to my letter asking of their possible interest.

So, I still grow these 6 clones, and hope that there may be interest in them from others someday!

Addenda:

A quick thought about stimulating sporophyte development on recalcitrant gametophytes. Could there be something in natural rain water that is not present in tap water of various sources? Perhaps small amounts of dissolved ozone? You, I and others had the same or similar problem with *Arachniodes standishii*. Yet, I have seen a number of instances where gametophytes self sown in the out-of-doors have produced sporophytes. Perhaps taking a pan of reluctant gametophytes out into a thunder storm would trigger development of sporophytes ????

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## **Proposed 2014 Foray**

The Hardy Fern Foundation and the British Pteridological Society are researching the potential for a joint foray to Japan in the fall of 2014. Details have yet to be determined, but if you are interested in further information as it becomes available, please e-mail Pat Riehl at [pwriehl@seanet.com](mailto:pwriehl@seanet.com) to be put on the mailing list.



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